

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A chemical amplification resist composition comprising a treated resin (1) obtained by contacting crude resin (1) with activated carbon, an acid generator and a solvent,

wherein resin (1) is

(a) a (meth)acrylic resin which is insoluble or poorly soluble in an alkali aqueous solution and becomes soluble in an alkali aqueous solution by the action of an acid, and which comprises a repeating unit having an alicyclic hydrocarbon group in its side chain (hereinafter referred to as "Resin (a)") or

(b) a styrenic resin which is insoluble or poorly soluble in an alkali aqueous solution and becomes soluble in an alkali aqueous solution by the action of an acid, and which comprises a repeating unit derived from hydroxystyrene (hereinafter referred to as "Resin (b)") (b)"),

wherein a clogging degree of the composition is calculated to be 0.9 or more when the composition is subjected to the following conditions:

a 23 °C, resist composition is poured into a filtration device in which a round and track-etch membrane filter (diameter: 47mm, average pore size: 0.05 μm , thickness: 6 μm , pore density: 6×10^8 pores/ cm^2) is set to a holder having a volume of 300 ml, and then pressure filtration is initiated at a pressure of 100 kPa;

the filtrate is collected in a receiver on a balance, and a weight change of the filtrate is checked each minute;

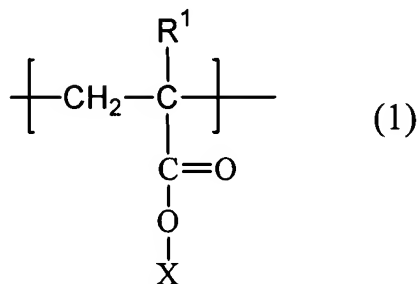
filtration time and accumulated weight of filtrate discharged are measured and linear velocity is calculated by dividing the weight of filtrate discharged per minute by the effective filter area;

a maximum value of linear velocity reached in 10 minutes after starting the filtration is defined as V1 (the linear velocity at an initial standard point);

the linear velocity at the point the accumulated weight of filtrate discharged reaches 15 grams converted to the weight of solid components of the resist composition is measured and calculated in the same manner and is defined as V2; and

the clogging degree is the value calculated by dividing V2 by V1.

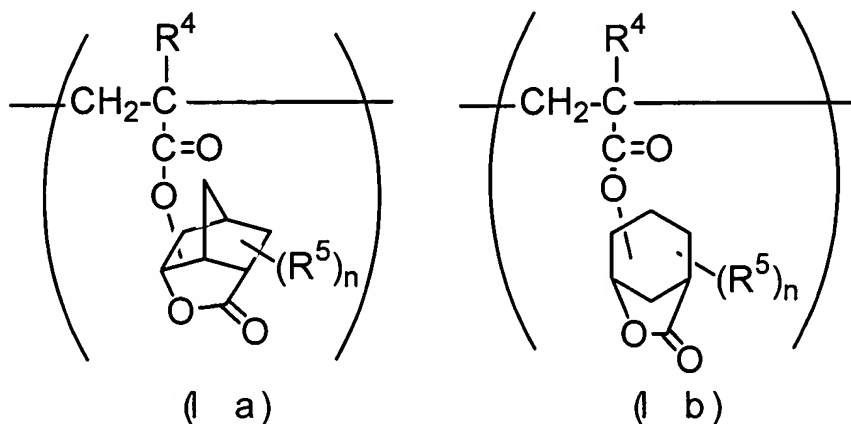
2. (Original) The chemical amplification resist composition according to Claim 1, wherein the resin (1) contains a repeating unit having acid labile group.
3. (Original) The chemical amplification resist composition according to Claim 2, wherein the repeating unit having acid labile group is a repeating unit having a group dissociated by the action of an acid.
4. (Original) The chemical amplification resist composition according to Claim 3, wherein the content of the repeating unit having a group dissociated by the action of an acid in the resin (1) is 10 to 80 % by mol.
5. (Original) The chemical amplification resist composition according to Claim 1, wherein the resin (1) is Resin (a) and the repeating unit having a alicyclic hydrocarbon group in its side chain is at least one repeating unit selected from the group consisting of a repeating unit derived from 2-alkyl-2-adamantyl (meth)acrylate and a repeating unit derived from 1-(1-adamantyl)-1-alkylalkyl.
6. (Original) The chemical amplification resist composition according to Claim 3, wherein the repeating unit having a group dissociated by the action of an acid is a repeating unit of the formula (1)



wherein R^1 represents hydrogen, methyl or trifluoromethyl, and X represents a residue of tertiary alcohol or a group represented by the formula of $-\text{CH}(\text{R}^2)-\text{OR}^3$, wherein R^2 represents hydrogen or C1-5 alkyl, R^3 represents C1-3 alkyl, (alicyclic hydrocarbyl)oxyalkyl or (alicyclic hydrocarbyl)carbonyloxyalkyl, or R^2 and R^3 bond to form alkylene having 5 to 10 carbon atoms

wherein at least one -CH₂- in the alkylene other than the -CH₂- connected to the adjacent -O- may be substituted by -O-.

7. (Original) The chemical amplification resist composition according to Claim 1 wherein the resin (1) is Resin (a) and Resin (a) further comprises at least one repeating unit selected from the group consisting of a repeating unit derived from 3-hydroxy-1-adamantyl (meth)acrylate, a repeating unit derived from 3,5-dihydroxy-1-adamantyl (meth)acrylate, a repeating unit derived from (meth)acryloyloxy- γ -butyrolactone wherein at least one hydrogen on the lactone ring may optionally be substituted by alkyl, a repeating unit of the following formula (Ia) and a repeating unit of the following formula (Ib):



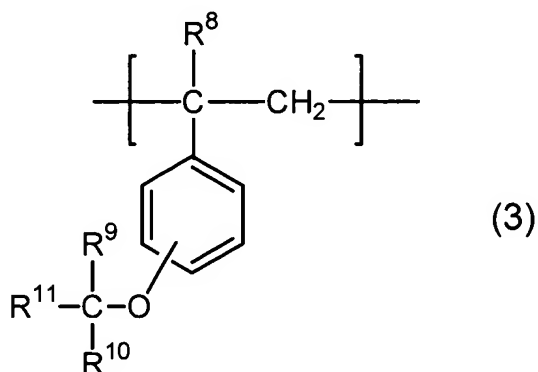
wherein R⁴ represents hydrogen, methyl or trifluoromethyl, R⁵ represents methyl or trifluoromethyl, n represents an integer of from 0 to 3, and when n is 2 or 3, each of R⁵ is the same or different.

8. (Original) The chemical amplification resist composition according to Claim 1 wherein the resin (1) is Resin (a) and Resin (a) further comprises at least one repeating unit selected from the group consisting of a repeating unit derived from an aliphatic unsaturated dicarboxylic anhydride and a repeating unit derived from 2-norbornene.

9. (Original) The chemical amplification resist composition according to Claim 1 wherein the resin (1) is Resin (a) and the crude Resin (a) is a resin produced by radical

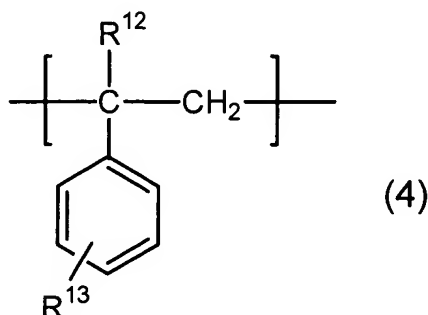
polymerization of a monomer having (meth)acrylic ester structure and leading to a repeating unit having an alicyclic hydrocarbon group in its side chain in an organic solvent selected from the group consisting of aromatic hydrocarbon, ether, glycol ether ester, ester, ketone and alcohol at a temperature of -50 to 100°C.

10. (Original) The chemical amplification resist composition according to Claim 3 wherein the resin (1) is Resin (b) and the repeating unit having a group dissociated by the action of an acid is a repeating unit of the formula (3)

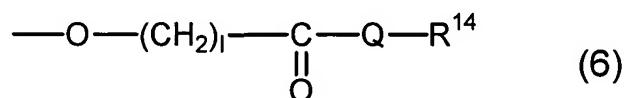


wherein R^8 represents hydrogen or methyl, R^9 and R^{10} each independently represents hydrogen, C1-6 alkyl, C3-6 cycloalkyl, C1-6 haloalkyl, C3-6 halocycloalkyl, or optionally substituted phenyl, or R^9 and R^{10} bond to form C5-10 alkylene chain, R^{11} represents C1-10 alkyl, C3-10 cycloalkyl, C1-10 haloalkyl, C3-10 halocycloalkyl or C7-12 aralkyl.

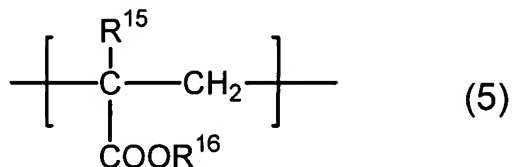
11. (Original) The chemical amplification resist composition according to Claim 1 wherein the resin (1) is Resin (b) and Resin (b) further comprises at least one repeating unit selected from the group consisting of a repeating unit of the formula (4) and a repeating unit of the following formula (5):



wherein R^{12} represents hydrogen or methyl, R^{13} represents hydrogen, C1-4 alkyl, C1-8 alkoxy, C3-8 cycloalkoxy or a group of the following formula (6),



wherein R^{14} represents C1-8 alkyl, C6-10 aryl or saturated heterocyclic group, Q represents single bond or oxygen, and l denote 0 or natural number,



wherein R^{15} represents hydrogen, methyl or trifluoromethyl, and R^{16} represents hydrocarbon group having bonding site at primary or secondary carbon.

12. (Original) The chemical amplification resist composition according to Claim 1 wherein the Resin (1) is Resin (b) and the crude Resin (b) is a resin produced i) by living radical

polymerization or living anion polymerization of protected hydroxystyrene, deprotection and re-protection, or ii) by radical polymerization of protected hydroxystyrene or protected hydroxystyrene and vinyl monomer, deprotection and re-protection.

13. (Original) The chemical amplification resist composition according to Claim 1 which further comprises an amine.

14. (Canceled)

15. (Original) A process for producing a chemical amplification resist composition which comprises contacting crude resin (1) with activated carbon to obtain treated resin(1), and mixing the treated (meth)acrylic resin, an acid generator and an organic solvent,

wherein the resin (1) is

(a) a (meth)acrylic resin which is insoluble or poorly soluble in an alkali aqueous solution and becomes soluble in an alkali aqueous solution by the action of an acid, and which comprises a repeating unit having an alicyclic hydrocarbon group in its side chain (hereinafter referred to as "Resin (a)") or

(b) a styrenic resin which is insoluble or poorly soluble in an alkali aqueous solution and becomes soluble in an alkali aqueous solution by the action of an acid, and which comprises a repeating unit derived from hydroxystyrene (hereinafter referred to as "Resin (b)").

16. (Original) The process according to Claim 15 wherein the resin (1) is Resin (a) and crude Resin (a) is produced by radical polymerization of a monomer having (meth)acrylic ester structure and leading to a repeating unit having an alicyclic hydrocarbon group in its side chain in an organic solvent selected from the group consisting of aromatic hydrocarbon, ether, glycol ether ester, ester, ketone and alcohol at a temperature of -50 to 100°C.

17. (Original) The process according to Claim 15 wherein the resin (1) is Resin (b) and crude Resin (b) is produced i) by living radical polymerization or living anion polymerization of protected hydroxystyrene, deprotection and re-protection, or ii) by radical polymerization of

protected hydroxystyrene or protected hydroxystyrene and vinyl monomer, deprotection and re-protection.

18. (New) The process according to Claim 15, wherein a clogging degree of the composition is calculated to be 0.9 or more when the composition is subjected to the following conditions:

a 23 °C, resist composition is poured into a filtration device in which a round and track-etch membrane filter (diameter: 47mm, average pore size: 0.05 μm , thickness: 6 μm , pore density: 6×10^8 pores/cm²) is set to a holder having a volume of 300 ml, and then pressure filtration is initiated at a pressure of 100 kPa;

the filtrate is collected in a receiver on a balance, and a weight change of the filtrate is checked each minute;

filtration time and accumulated weight of filtrate discharged are measured and linear velocity is calculated by dividing the weight of filtrate discharged per minute by the effective filter area;

a maximum value of linear velocity reached in 10 minutes after starting the filtration is defined as V1 (the linear velocity at an initial standard point);

the linear velocity at the point the accumulated weight of filtrate discharged reaches 15 grams converted to the weight of solid components of the resist composition is measured and calculated in the same manner and is defined as V2; and

the clogging degree is the value calculated by dividing V2 by V1.